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THE 3rd INTERNATIONAL SYMPOSIUM FOR SUSTAINABLE HUMANOSPHERE (ISSH) - a Forum of The Humanosphere Science School (HSS) 2013, Bengkulu Indonesia, September 17-18, 201

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"THE DYNAMIC INTERACTION BETWEEN PEOPLE AND ECOSYSTEMS FOR THE FUTURE OF HUMAN SUSTAINABILITY"

Gedung Rektorat,
University of Bengkulu,
Bengkulu-Indonesia.

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PREFACE

The 3rd International Symposium for Sustainable Humanosphere 2013 attracted the interest of scientists from Indonesia and Japan. The symposium covered the disciplines of community-based development and social economic science (climate change and society; ecosystem and community; the economical of natural resources; the role of traditional knowledge and values in managing ecosystems; women and natural resources), atmospheric science (airpollution; equatorial atmosphere; global climate change models; land-ocean weather systems; radar observations; solar activities; space environment; weather patterns), biosphere science (agricultural in changing world; animal ecology and animal husbandry; anthropological approach; bio-indicator; ethnobotany; food security; human development index), geosphere science (earth geological dynamics and natural disasters; earth carbon cycle dynamics; heat, water and CO; hydrology and water management system; land resource management), wood science and technology (biomass conversion; carbonized wood based composites; cellulose; chemical, physical and mechanical properties of wood; timber structure; wood for energy; wood cell formation; wood biochemistry; wood anatomy and plant physiology; wood deteriorating organisms; wood preservation; wooden construction; wood-based material; wood adhesive), wood and urban pest management (insect pest management, ecology and biology of urban pests, control of urban pest including biological, cultural, mechanical, physical and chemical controls), and forest science (biodiversity and society; biodiversity in tropical plantation forests; climate change and biodiversity; forest biomass dynamics; forest carbon accounting and monitoring; forest fire; invasive species; intensive silviculture; structure, growth and function; tree biotechnology). The technical program consisted of 38 oral presentations under 11 sessions and 19 poster presentations.

This publication is a compilation of presented papers. Every effort has been carried out to retain the original meaning and views of authors during the editing processes. All claims on trade products and processes and views expressed do not necessarily imply endorsement by the editors.

We believe that this publication will be a useful source of information and achieved its primary objective of disseminating new experiences and information to researchers, academics, policy makers and students.

The organization of this international gathering and compilation of the proceedings could not have been achieved without the combined effort of all members of the organizing committee and the supports of Research Institute for Sustainable Humanosphere (RISH), Center for South East Asian Studies (CSEAS) Kyoto University, International Center for Interdisciplinary and Advanced Research (ICIAR) ï LIPI, University of Bengkulu (UNIB). The editors hereby wish to acknowledge the contributions of all parties.

Editors

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THE CHALLENGES FOR SUSTAINABLE FOREST MANAGEMENT IN BENGKULU PROVINCE: A BROAD REVIEW

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Abstract

The total forest area constitutes 46% of land area of Bengkulu Province. Of the forest area, 77% is conservation and protection forests where tree cutting is not allowed, so these forests are perceived by local people and local government as hindrance to economic development. Currently forestry sector contributes little to the economy of Bengkulu. In the past, several forest concession companies operated in production forest. But their practices were not sustainable so their permits were not renewed by the Ministry of Forestry. A new concession company is now operating in Bengkuluôs production forest. Much of production forest area has been neglected for many years, so some of which has been occupied illegally by local people as well as plantation companies. Much of the protection forest has been cleared for plantation too. Even the most guarded forest, the conservation forest, also suffers encroachment. Deforestation and degradation of forest will continue unless fundamental measures are taken to develop sustainable forest management. Managing forest in a developing country is essentially managing people. So, we must work to tackle the social aspects of forest management. First, we must hold continuous dialog among stake holders to have common understanding on the need for sustainable forest management. Second, we must improve the implementation of social forestry and forest rehabilitation programs which have been conducted. Third we must enforce the laws strictly for those illegally cut trees or occupy forest areas. Finally we should accelerate the creation of forest management units and empower the existing one. To achieve sustainable forest management in Bengkulu is a very challenging task, requiring concerted efforts of all stakeholders.

Keywords: Sustainable forest management, Bengkulu

Introduction

The concept of sustainable forest management

As a renewable resource, forest can be harvested on a sustainable basis. Although the term sustainable forest management is relatively new, actually foresters have known the concept of sustainable since the 18th century [1]. For two centuries forest exploitation has been based on the maximum sustained yield principle. Originally the purpose of this principle is to ensure the sustainability of timber production from the forest. This principle can be achieved by determining the volume of timber that can be harvested based on the stand increment or treesô growth. Several methods have been developed to determine the annual allowable cut in order to get maximum yield without reducing the forest potential to produce timber in the following harvest cycle.

In the 20th century, forest was seen not merely as timber producer but as an ecosystem with many functions. The sustainable principle was, therefore, expanded to include non timber forest products and other forest ecosystem functions such as water protection, recreation and wildlife conservation. In the US the principle was implemented in the Multiple-Use Sustained Yield Act of 1960. In Indonesia multiple use of forest was also recognized in the Forestry Act of 1967 which designated forest into several four categories: production, protection, nature reserve and nature recreation. In the new Forestry Act of 1999 Indonesian forest is classified into production, protection and conservation forests.

Although foresters have known the sustainable principle for two centuries, the utilization of forest around the world has not been sustainable, and neither have those of other natural resources. In response to the depletion of natural resources and environmental degradation, in 1987 the United

Nation World Commission on Environmental and Development introduced the concept of sustainable development defined as development that meets the needs of the present generation without compromising the ability of future generation to meet their own need. The Earth Summit in 1992 in Rio de Janeiro, the United Nation Conference on Environment and Development adopted Forest Principle which captured the concept of sustainable development in forestry sector. Sustainable Forest Management aims to ensure that the products and social, cultural, and environmental services provided by forests meet the needs of the current generation, while at the same time maintaining their availability for the development needs of future generations [2]. Sustainable forest management encompasses three aspects: ecology, economy and social. The Forest Stewardship Council [3] put it appropriately that forest management must be environmentally appropriate, socially beneficial and economically viable. Ecologically, the biodiversity, productivity and ecological process of forest must be maintained. Economically, forest must be structured and managed to be sufficiently profitable without generating financial profit at the expense of forest resources, the ecosystem and the affected communities. Socially, forest management must helps local people and society at large to enjoy long term benefits and provides strong incentives to local people to sustain the forest resources and adhere to long term management plan [3].

Challenges in implementing sustainable forest management

Ideal it may sound, the concept of sustainable forest management is not easy to implement [1]. The concept of SFM is very complex and different parties may have different ideas on the sustainability. To standardize the implementation of SFM, several institutions and working groups (such as, International Tropical Timber Organization, Montreal Process, Forest Europe, Forest Stewardship Council) have developed principle, criteria and indicators for SFM. These criteria and indicators have been used to measure whether a given forest management unit has been managed according to sustainable principle. Some countries have modified these criteria and indicators to suit their particular needs. There are, however, some criticisms on the criteria and indicators for SFM. Howard [4] found several self contradictions within the criteria and indicators that foresters must apply at the forest management unit level. The criteria for three components (ecology, economy and social) of SFM are commonly regarded as competing, or even mutually exclusive, so it is impossible to meet the three aspects of SFM at stand level, but it is possible at broader spatial scales, such as regional and national scale [5].

In Bengkulu and many provinces in Indonesia, the challenge for SFM implementation is not at conceptual levels but at the practical level, namely: how to solve land conflict and to protect the forest from illegal activities. There is no guarantee that the existing forest stand will continue to exist next year because of illegal logging and encroachment. No SFM can be implemented unless illegal activities and land conflict are resolved. Forestry conflicts escalated drastically when the New Regime collapsed in 1998. Local communities who used to be suppressed by the government committed illegal logging and cleared the forest area for plantation. The conflict decreased in 2001 but was still twice than that in 1997 [6]. Data from the Ministry of forestry showed that between 1990-1997 deforestation rate in Indonesia was 1.8 million hectares per year [7]. It increased to 2.83 when the new order collapsed. Since 2000 the deforestation rate declined to 1.08 million hectares per year.

Conflicts in forestry sector result from different ideas and interests among stakeholders. Implementing SFM will require minimizing the conflicting ideas and interests. Even among the government institutions there are conflicting interests. Often, local governments have different interest from the central government. Although local governments have been given authority to manage production and protection forest since the collapse of New Order, all forestry regulations are made by central government. Local governments, therefore, have no freedom in managing forest areas. As a result, many governors and regents have submitted their request to the Ministry of Forestry for the conversion of forest areas into other land uses. Only few requests have been granted.

In the past, the interest of the Ministry of Forestry was represented by local forestry offices. But, since the autonomy era began, the local forestry offices have been loyal to governors and regents because the head of forestry offices are appointed by governors or regents. Now, at the provincial level, the Ministry of Forestry is represented by the Agency of Natural Resource Conservation and the Agency of National Park which manages conservation forest, and by the Agency of Watershed management which deals with land rehabilitation and social forestry program.

Local people have another interest. They want to get a greater access to forest resources and get the economic benefit from them. Some communities do have legitimate claim over forest area,

because their ancestor had utilized the land. Their claim is further reinforced by the decision of constitutional court that tribal forest can no longer be classified a state forest. To achieve SFM in Bengkulu, land conflict and illegal activities must be minimized first, then best practice of forest management should follow.

Bengkulu Forest

Area and categories

Bengkulu Province consists of 2,007,223 hectares of terrestrial area. About 46%, i.e. 924,631 ha, of this terrestrial area are legally defined as forest areas. Forests in Bengkulu are divided into several categories: protection forest, production forest and conservation forest (Table 1).

Table 1. The detail of forest areas in Bengkulu based on Minister of Forestry Decree No. 784/Menhut-II/2012

No.	Forest classification	Area (ha)
1.	Conservation area	438,095
2	Protection forest	250,750
3	Production forest	210,916
	TOTAL	**924.631**

It can be seen that most of forest areas (77%) in this province are categorized into protection and conservation forests. Therefore, challenges in managing the situation differ from other provinces where production forests are more dominant. The existence of protection and conservation forest is more perceived as burden in regional development rather than a window of opportunity for innovation. However, in the middle of the growing issues on climate change, forestry programs aiming to conserve and to improve forest cover are increasingly important.

Problems

Forestry sector in Bengkulu faces many serious problems. Deforestation has been happening for years. One cause of this problem is illegal occupation of forest areas by local people.

This illegal occupation has increased after reformation era. Illegal occupation means that people cut forest without permits and some turn it into farming fields. This activity creates a conflict between those people and the government.

Based on land satellite imagery analysis, significant areas of plantations and agricultures (about 130,000 ha) occupy forest areas [8]. The vegetation cover of national parks remains in an appropriate condition, consisting of 76% of primary and 16% secondary forests. On the other hand, only 42% of protection forests remain primary forests and 33% are secondary forests, which mean that 25% of protection forest areas are not forest vegetation. The production forest is in much worse condition where it has lost about 50% of its forest coverage [8].

On the other hand, population continues to grow. Bengkulu Statistical Bureau [9] reported that the total population in Bengkulu is about 1,742,080 people, about half of whom are workforce and the majority are farmers. A fast population growth and limited natural resources are potential sources of tenure conflicts. Natural resources conflicts, in this case the conflict in using forest areas, are the result of some problems. According to Wulan *et al*. [6], based on media and field report, the causes can be divided into 5 categories; border, illegal logging, illegal occupation, environmental damage and the change of forest function.

As more than 2/3 of Bengkulu forests are protection and conservation forests areas, land availability for productive activities, such as farming, are limited. In contrast, more than half of Bengkuluôs people are farmer, especially perennial plants (coffee, pepper etc.). It is obvious that their life depend on the land availability. In addition, their farming techniques are mainly traditional, which is not very effective, so that they need more agricultural lands in order to increase their production. Thus, some of them occupy protection forest that should not be exploited. Indeed, soils of this area are very fertile and very suitable for annual plants.

In terms of population mobility, there is lack of administrative control. Many people moved to village around protected areas and could not be detected. These people come from other districts or even other provinces, such as South Sumatra. Then, they cut forest and turn it into farming fields.

These people are not recorded because of the lack of citizenship administrative system; thus their mobility cannot be monitored, including their agriculture activities.

Another problem is unclearness forest boundaries. In several cases, settlements, in which they have legal structure (village leader etc.), are actually in protection forest areas. One example is Tanjung Alam village. Total areas of this village are 1,500 ha with 1,164 number of population. In fact, after the government remapped the forest area, 1,400 ha of the village area are protected areas [10]. They have settled there for several decades and there have been no actions taken by the government, so they considered that there is nothing wrong with that. Another case, agricultural fields are very near with protected forest areas. It makes those farmers easily to broaden their fields by cutting down the forest. They argue that they do not know if those lands are protected areas. This is not only because there are no clear signs of the borders but also there is no socialization from the government about the borders. The other reason that illegal occupation of forest areas keeps happening is that there are no legal actions in order to punish the laws breakers. Therefore, they are not afraid to occupy the areas. The lack of law enforcement in fact has encouraged other people to do the same thing.

Some communities, however, have legitimate claim over forest areas because they ancestors had occupied the land before the designation of forest areas by the government. In 2012 forest area boundary was revised because to accommodate the claims of communities. Many other claims have not been settled yet.

If these problems are only tackled by the government, it evidently will not generate a fruitful result. Community participation is important part to ensure the success of programs in forestry sector. We know that it is not only the government will suffer from the effects of damaged forest and ecosystems, but also the people. By collaborative management, the community actively participates in decision making on how forest will be managed. Forest management should also consider the community welfare itself, which in return, the society will also responsible in forest conservation.

Social forestry is one type of the involvement of the community on management of forest area. Through this program, the community can utilize the forest area with little negative impacts on the forest function. It is not only reducing the pressure on the forests, but also resolving some social related problems around the forest area. However, the forest areas in Bengkulu that have been intervened by the program are still so narrow, which only cover about 2,667 ha till 2011 [11]. Therefore, this type of program has to be prioritized by the authority.

Although the need on the forest product, i.e. timber, keeps increasing, the production of timber from production forests is still small. Based on the survey during 1996 ï 2009, forest stands on one hectare of forests in Bengkulu are potentially to content about 130 m^3/ha of timber [11]. It can be estimated that 200,000 ha of production forests would results a huge amount of timber, although it is only about 50% production forests areas which are still covered by tree vegetation. However, the timber production in Bengkulu is significantly low (Table 2). To fulfill the timber demand, the government should optimize the legitimate utilization of production forests through forest consessions, which could be granted to private companies or community organization such as ñkoperasiò. Otherwise, protection and conservation forests are potentially to be illegaly logged to provide the market need.

Table 2. The recapitulation of timber log production per regency for the last 5 (five) years (Source: Forestry Beureau of Bengkulu [12])

No.	Regency	Timber log production per year (m^3)				
		2008	2009	2010	2011	2012
1	North Bengkulu	0	0	1,953	124	3,997
2	South Bengkulu	181	29	0	2,922	4,823
3	Rejang Lebong	409	260	0	0	669
4	Bengkulu City	0	0	0	0	0
5	Mukomuko	848	1,036	1,047	4,645	0
6	Seluma	0	0	1,436	0	0
7	Kaur	1,154	0	0	0	0
8	Lebong	0	0	0	0	0
9	Kepahiang	208	198	0	0	751
10	Central Bengkulu	0	0	223	428	197
	TOTAL	2,800	1,523	4,659	8,119	10,437

Fundamental Measures for Sustainable Development

Dialog among stakeholders

Sustainable forest management can only be achieved if conflicting interests among stakeholders can be reduced to a minimum level. In the past, local forestry offices were representative of the MOF, so they had no conflict of interest with the MOF. Since the autonomy era began, local forestry offices and MOF had different interest and priorities regarding the forest resources, so there must be dialog between local government and MOF. Suhirman *et al*. [13] from their study on the implementation of community based forest management recommended that the MOF and local governments had to make agreement to do collaborative works. Dialog between local government and the MOF should also result in better regulations and financial arrangement in forestry sector.

In the past conflicts between local people and forestry office or forest companies were suppressed by forces. This method is no longer acceptable. So, dialog between government and local communities must be conducted too. It will take long time lime before all parties come to an agreement, but it is impossible to eliminate all differences.

Different opinion regarding forest may not all result from different interest but some may be due to different knowledge of the function of forest. The ministry of forestry must explain the different categories of forest and their functions. In reality, however, the biophysical conditions of forest do not always meet the criteria for the designated categories. For example, some nature reserve strict areas do have highly specific natural features to protect. Or, some relatively flat forest areas are categorized as protection forest. The ministry of forestry should be willing to negotiate on the category of forest when the actual conditions do not meet the criteria stipulated by the government regulations.

Many local governments perceive protection forest and, especially, conservation forest as hindrances to economic development because no logging can be done in these forest categories. Environmental education must be given to government officials on the role of these forests to protect watersheds which supply water for multiple purposes, to absorb carbon from the atmosphere, and to protect biodiversity which provide various benefits to human. With the help of NGOs the local communities must be educated too.

In the last ten years the role of forest in sequestering carbon has been emphasized. Carbon trading as mechanism to protect forest from degradation has been popularized. The Ministry of Forestry has issued decree on the procedures to get payment from REDD. In practice, however, local government and local people have not benefitted from carbon trading. Simpler procedures to get compensation need to be developed.

Social forestry and forest rehabilitation

Currently in Indonesia there are more than 19 thousand villages located near and within forest areas with a total population of 48.8 million. Bengkulu forests are also located near human settlements. Those people have fulfilled some of their daily need from forest areas. After the large scale exploitation of forest outside of Java began at the late 1960s, many rural people have been deprived access to forest areas. To achieve SFM, rural people must be involved in the management of forest. This concept is called social forestry.

The term social forestry has been used with various meanings. It can be used to describe a relatively narrow range of activities that produce fire wood from small woodlots in order to reduce deforestation, or, it refers to forestry activities conducted mainly to improve the welfare of the poor, as opposed to purely commercial activities [2]. The Ministry of forestry defines the term social forestry as a system of forest resource management in state forest or private forest involving local communities as the actors or partners in order to improve their welfare and to conserve the forest [13]. Another term having similar meaning is community forestry. RECOFTC defines it as a practice that ñincludes all aspects, initiatives, sciences, policies, institutions, and processes that are intended to increase the role of local people in governing and managing forest resources [14].

The Ministry of Forestry has conducted social forestry programs since 1970s using different names and schemes. In the 1970s, the state-owned forest company in Java introduced the prosperity approach program referring to forestry programs to improve the welfare of local communities. Other programs or terms include forest village development, forest village community development, community forestry, community-based forest management, forest management together with the community, forest management by the communities [15].

In Bengkulu, the Ministry of Forestry started establishing community forestry in the mid 1990s. However, the social forestry programs have not been successful in Bengkulu province as well as at national level due to the complexity of the problems. The ministry of forestry itself has not settled with the concept of social forestry. This is reflected in the rapid changes of regulations regarding community forest. In 1995 the Minister of Forestry issued a decree no 622 regarding community forestry. This decree has been replaced or amended several times with the following decrees: no 677 (in the year of 1998), no 865 (1999), no 31 (2001), no 37 (2007), no 18 (2009) and no 13 (2010).

The MOF has not enthusiastically implemented social forestry. The decision makers in the MOF are forestry graduates trained in forestry faculty, who studied forest mostly from silvicultural and management aspects. They are not sufficiently trained in resolving social problems. Forest is viewed more as natural resource, and the people living in the forest are not seen as the integral part of the ecosystem, but as illegal encroachers. Land tenure is the main cause of conflicts between communities and forestry authorities [16]. Awang [14] believes that social forestry programs have failed because agrarian law has not been reformed.

Limberg *et al*. [17] found several constraints in the implementation of community forestry in Malinau, East Kalimantan. The constraints in the village were: the weak institutional capacity, the unfair profit sharing, the lack of effective conflict resolution, the lack of market information, the lack of equipments, the high transportation cost and the unclear forest boundary. At the district government level, the constraints were: the limited experience and knowledge regarding community forestry, the high number of facilitators needed, the difficulty in implementing community at large scale, and the lack of legal certainty of property right and tax and its consequence on the access and control of forest areas. the constraints at the central government level were: the difficulty in developing regulations ensuring sustainability and at the same time adjustable to local conditions, the difficulty in developing tax and profit sharing mechanisms for community forestry, and the difficulty in monitoring and controlling the regulations. The NGOs had difficulties in providing enough number of facilitators, bridging the interest of government and communities, implementing lesson-learned from experience in other places and preventing communitiesô dependence on NGOs. The many constraints in the implementation of community forestry have prevented the MOF meeting its target. Community forestry and village forest can be developed only in villages which have intensive facilitation from NGOs and other social forestry supports.

Suhirman *et al*. [13] in their studies on the implementation of community based forest management (CBFM) in four provinces found three fundamental problems and another additional one. First, the MOF, provincial government and district government had different priorities in implementing CBFM. For the MOF the implementation of is CBFM is important so they had higher target, meanwhile for provincial and district governments forestry sector may not be important, so they had no target for CBFM implementation. Second, the relation among parties, namely the MOF, provincial government, district government and NGOs were not solid because they were only bound in a forum, whose activities were mostly socialization and not making decisions. Third, there were differences in financial capability. The MOF had sufficient fund to implement CBFM, but since the autonomy era began the role of central government to finance local program has been limited. Meanwhile, the local governments, which should have played a greater role, did not have sufficient fund and human resources to implement CBFM. In addition to the three fundamental problems above, another problem arose from the view of local government that implementation of CBFM was merely a forestry sector, whereas actually the implementation CBFM would require a concerted efforts among local government offices.

Although there are many constraints, social forestry must be continued because the MOF as well as local forestry office wonôt be able to control all forest areas. People have already occupied forest areas. Social forestry program will regulate the involvement of people in forest management. Without social forestry, many forest areas will be accessible to everybody who will race to loot them as much as he can. The social forestry programs which have been conducted since the 1990s must be continuously improved by strengthening the institutions in villages and communities which will manage the forest, improving the quality and increasing the number of facilitators, simplifying the procedures in the government, adjusting regulations which facilitate the selling of forest products, enforcing the law for illegal activities.

The communities must continue to be involved in forest rehabilitation. For several decades, forest rehabilitation program in general has not been successful. The rate of rehabilitation is less than the rate of forest degradation [18]. In the 1970s, forest rehabilitation was conducted with top down

approach, but since 1990s communities have been actively involved. During the Megawatiôs presidency era, the reforestation program was revived or renamed into a Movement for Land and Forest Rehabilitation. During the SBYôs presidency era, the government commitment for land and forest rehabilitation is even greater because the President has pledged to the world that Indonesia would reduce carbon emission up to 26% by 2020. Planting trees is the solution for absorbing carbon from the atmosphere. The MOF during MS Kabanôs ministerial era created a slogan: Plant Today, Harvest in the Future. Subsequently the MOF created another slogan: One Man One Tree. In 2012 the MOF had a movement to plant one billion trees and created a new slogan More Trees More Bounties.

The MOF must always evaluate and improve the policy and implementation of forest rehabilitation. Local communities should be involved not only in the planting phase, but since the planning phases. The selection of species, number plants and areas of planting should match with the need of local communities. For several decades, fast-growing, exotic species have been planted nation-wide. Those species may be good if the objectives of reforestation are to increase forest coverage and to prevent erosion, but those species may not what the local people needs. The financial arrangement should ensure the maintenance of the plants. The sustainability of the program would depend on the benefit people get from the program. The government should, therefore, help the marketing products of the plants. To improve the capacity of local communities, the government should finance NGOs to provide facilitation to the local communities. In short, the forest rehabilitation program should be integrated with other development programs of the local communities and it should address the causes of deforestation [18].

Law enforcement

Illegal logging and other forestry crimes are the constraints for achieving SFM and therefore must be combated. They also cause large economic loss to the nation. Illegal logging, corruption and mismanagement in forestry sector in Indonesia was estimated to cause US$2 billion loss in 2006 [3]. This amount included forest taxes and royalties not collected on illegally harvested timber; shortfalls due to unacknowledged subsidies to the forestry industry (including basing taxes on artificially low market prices and exchange rates); and losses from tax evasion by exporters practicing ótransfer pricingô. It was estimated by EIA/Telapak that in 2001, approximately 73% of logging in Indonesia was illegal. This figure might be too high. A consensus among sources estimated that illegal logging account for more than 40% of Indonesiaôs total wood supply [3].

Crimes in forestry are the result of failure of rule of law which can be divided into two types, namely the failure of law and the failure of implementations [19]. Failures of law include: (a) Clashes of norms, when ñthe rights to the resources as set out in law are not the same as the rights that people or communities believe that they are entitled to haveò, (b) Undetectable violations, when the law is written in such a way that makes it difficult to enforce, (c) Weak penalties, resulting in insufficient punishment to deter criminal behavior and (d) Conflicting legislation. Failures of implementation include: (a) Poor dispute resolution, which can lead to solutions outside the law, (b) Unfair application of the law (for example, bias, patronage, corruption, and so on), (c) Failure on the part of forest agencies to follow the law, (d) Lack of capacity to enforce the law, (e) Lack of capacity to administer the law, (f) Lack of coordination among government agencies, (g) Lack of enforcement of laws outside the forest sector (for example, in banking or immigration law), (h) Lack of government oversight. Most of the above points are found in Indonesia.

Several international and national efforts have been done by the Indonesian government to combat illegal logging and other illegal activities, such as engaging in the Forest Law Enforcement, Governance and Trade (FLEGT) process, bilateral agreements between Indonesia and major importers of timber, as timber certification and conducting joint security sweeps [3]. To improve law enforcement in forestry sector we also need to improve the governance because weak law enforcement in forestry sector is associated with poor quality governance not only forestry sector but also in other sectors [19]. Indonesian government has poor record on corruption, and since the autonomy era began, the corruption has spread to provincial and district levels. Many governors, mayors, regents and parliament members have been indicted for corruption. The high cost of election has caused pervasive corruption among politicians.

The implementation of social forestry can improve law enforcement because the communities who have the license for managing the forest will have willingness to protect the forest. So far, many communities living near the forest border have not had the courage and willingness to prevent illegal logging committed by other people because they would not have advantage for doing so.

Creation and empowerment of forest management units

In Java, most forest areas are managed by Perhutani, a state-owned forest company. The forest areas in Java are divided into many management units, each managed by the head of forest management unit and his or he staff. Each forest management unit is large enough to be managed on a sustainable basis. The government regulations mandate that all forest areas in Indonesia must be divided into management units too. In reality, however, only recently has the ministry of forestry established forest management unit models outside Java. In Bengkulu there is only one forest management unit.

Forest area licensed to a forest concession company is essentially a management unit. Within a concession area sustained yield principle can be implemented, especially for timber production. However, many forest concession companies have not implemented sustained yield principle. They cut more than the allowable cut. As a result, before the first harvest cycle ended most concession areas had been logged. The MOF did not renew their licenses. In Bengkulu there used to be 5 concession companies operating in production forest, but all of them didnôt get their license renewed. A great part of the forest areas left by the concession companies have been taken by communities as well as plantation companies. The forestry offices at district and provincial level do not have enough resource to manage the forest directly. Their roles are mostly administrative. Technical aspects of management are out of reach.

To have a better control of forest areas, the government must create more forest management units, each managed by a complete organization capable of implementing SFM. Currently the only one forest management unit in Bengkulu has so incomplete organization structure that it is impossible to do the job. To function effectively the organization must be empowered by appointing complete competent staff so it can conduct all aspects of forest management. Since recruiting new staff will add financial burden to the District of Mukomuko, the completion of the organization can be done by relocating of government officials from the office of forestry to the forest management unit.

Subsequently, other forest management units must be established in other districts. As mandated by the government regulation, finally all forest areas in Bengkulu must be divided into forest management units.

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